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A review of the *Erigeron pappocromus* Labill. complex

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ABSTRACT
The *Erigeron pappocromus* Labill. complex occurs in alpine and sub-alpine areas of south-eastern Australia. A review of the complex indentifies nine species. The generic status of the complex is discussed, and the complex assigned to *Erigeron* pending further studies.

Introduction

The first *Erigeron* collected in Australia was that found in 1792 at Recherche Bay in Tasmania by J.J.H. Labillardière during D'Entrecasteaux's voyage. The specimens provided the basis for the description of *Erigeron pappocromus* ('*pappocroma*') Labill., *Nov. Holl. Pl.* (1806). J.D. Hooker's explorations of Tasmania in 1840 resulted in the publication of four new species (*viz. E. bellidioides, E. gunnii, E. stellatus, E. tasmanicus*) based on Ronald Campbell Gunn's collections (Hooker, J.D. 1847). Hooker identified all but one of the Tasmanian species recognised in this paper under *(H)Aplopappus*. In 1856 in *Flora Tasmaniae*, Hooker reconsidered both the generic status and specific ranks within the *E. pappocromus* group. Hooker reduced two of the species published in 1847 to varieties, and transferred all taxa to *Erigeron*, thereby accepting Labillardière's original generic assignment.

This later and more conservative treatment of the *Erigeron pappocromus* group reflects the difficulty Hooker had in accommodating Australian mainland material sent by Mueller. '[*Erigeron gunnii*] very *much resembles E. Tasmanicum, but is covered everywhere with glandular pubescence, has much broader, often toothed leaves, with shorter petioles and stouter scapes, with fewer and longer bracteoles. Mueller sends a form of this species, with much stouter setae on the leaves than the Tasmanian specimens, and considers it a variety of E. Pappochroma. It does not at all resemble that species in general appearance, but without a very full series of specimens of subalpine plants, from many localities, it is not possible to ascertain the limits of their variation.*' The glandular pubescence, although a feature of *E. gunnii* (Tas.), *E. paludicola* (Vic., N.S.W.) and *E. nitidus* (Vic., N.S.W.), is not a feature of *E. bellidioides* (Tas., Vic., N.S.W.) although these species appear to be closely related.

In 1867 Bentham reviewed all of the Australian material available but he was unable to clearly distinguish the taxa recognised at that time. Bentham noted that, '*The ... varieties, all alpine, appear at first sight to be distinct species, but it is difficult to assign any precise limits to any of them.*' Bentham treated the typical form as a new variety (*E. pappochroma* var. *billardieri*) and followed Hooker in treating *E. bellidioides* and *E. gunnii* as a single variety (*E. pappochroma* var. *gunnii*). Of the mainland forms, Bentham recognised only *E. setosa* as *E. pappochroma* var. *setosa*.

Erigeron is now accepted as being masculine (ICBN 62.1 ex.1), although earlier authors treated the name as feminine or neuter. Paul Wilson (*pers. comm.*) argues that Labillardière's spelling of the specific epithet for *E. pappocroma* was intentional, .and further, that Labillardière was was treating '*pappocroma*' as an adjective, and giving the genus a feminine gender. Labillardière frequently modified Latin or Greek words to make names more euphonius. Paul Wilson cites the example of *Calytrix* rather than *Calythrix* or *Calycothrix*. J.D. Hooker (1847) changed the spelling to '*Pappochroma*' under the genus *Aplopappus*. Hooker apparently considered Labillardière's spelling

incorrect. The capitalisation of the first letter of the specific name suggests Hooker's view that the specific name was derived from a generic name.

Generic status

The absence of native *Erigeron* species from New Zealand, and the clear distinction between the *E. pappocronus* Group and the other Australian *Erigeron* species has resulted in speculation with regard to generic status (Hooker 1856; Given 1973). Whereas Given tentatively places *Erigeron pappocronus* in an assemblage including *Damnamenia, Celmisia, Pleurophyllum* and the macrocephalus species of *Olearia*, the analysis is a preliminary one. In particular the relationship between *Erigeron pappocronus* and South American and Northern Hemisphere *Erigeron* species requires examination. Examination of the alpine New Guinean *Erigeron* species recognised by Van Royen (1983) is also desirable.

Nesom (1994a) segregated *Erigeron setosus* and *E. stellatus* into the new genus *Lagenithrix* Nesom, and the remainder of the Australian species in the *E. pappocronus* complex into *Lagenopappus* (*viz. L. pappocronus* (Labill.) Nesom, *L. gunnii* (Hook.f.), Nesom and *L. tasmanicus* (Hook.f.) Nesom, and, by inference, *Erigeron* sp. A, *Erigeron* sp. B and *Erigeron* sp. C *sensu* Costin *et al.* 1979).

Although the generic status of the *E. pappocronus* complex requires further examination, the analysis by Nesom is unhelpful.

Nesom suggests '[*E. setosus and E. stellatus's*] *putative relationship to Erigeron is hypothesised to be superficial and they are recognised here as a separate genus.*' (*viz. Lagenithrix*), however, the analysis presented is unsatisfactory. The descriptions indicate that Nesom has observed only a few specimens. Characters used by Nesom to distinguish *Lagenithrix* include a tendency to produce 4-merous corollas in *E. stellatus* (although Nesom illustrates the typical 5-merous form), the smooth achenes with occasional viscid glands, and the short, thickened neck. The indistinct development of these features is of doubtful significance in determining new genera within the *E. pappocronus* complex. In particular, 4-merous corollas have not been observed in *E. stellatus*, the achenes are not smooth in *E. setosus, E. stellatus* and *E. trigonus*, and the 'thickened apical collar' is rather illusory and certainly not comparable to that of *Lagenifera*. Nesom notes additional characters including the stoloniferous habit, obovate to spathulate leaves, short white ligules, and sterile disk florets. The stoloniferous habit reflects the more exposed alpine habitat of *E. setosus* and *E. stellatus*, while the remaining characters are inconclusive. The fertility of the florets is difficult to establish as mature achenes are rarely produced, possibly reflecting harsh conditions at anthesis. Further study of the breeding systems is recommended.

In distinguishing *Lagenopappus* from *Erigeron*, Nesom suggests the importance of '*...achenial glands and other features that are more similar to Australian genera than true Erigeron.*' *Erigeron trigonus* lacks achenial glands, and the 'other features' remain obscure. The presence of a well-developed pappus and the broad-lanceolate or triangular style-branches, abaxially papillose, of the disk florets suggest links with northern hemisphere *Erigeron* and South American *Haplopappus*.

Further, Nesom suggests '*it is not clear that Lagenopappus and Lagenithrix are even most closely related to each other, their similarities apparently plesiomorphic in nature.*' Clearly Nesom has no field knowledge of the *E. pappocronus* complex. The common alpine habitat, and clear gradation in the series of species from *E. pappocronus* to *E. tasmanicus* and *E. stellatus* are strongly suggestive of a common origin. The generic boundaries between *Lagenopappus* and *Lagenithrix* outlined by Nesom reflect differences in habitat. The differences in dimensions suggested by Nesom are not supported by the material examined for the preparation of this paper.

Nesom (1994b) later amends the nomenclature of Australian *Erigeron* species referred to *Lagenoappus*). In this latter paper, Nesom accepts that the correct generic name for the *Erigeron pappocronus* complex is *Pappochroma* Raf. and considers *Pappochroma uniflora* Raf. the correct name for the type of the genus. Paul Wilson (*pers. comm.*) argues that the correct name for the type of this genus is '*Pappochroma*

pappocromum'. Rafinesque treated the genus as feminine, and presumeably considered that such a combination would result in the creation of a tautonym.. As the Greek 'chroma', is neuter, the name '*Pappochroma pappocromum*' is legitimate, and the name *Pappocroma uniflorum* '*uniflora*' is superfluous and accordingly, illegitimate.

Further studies of the intra and intergeneric relationships of species in the *Erigeron pappocromus* complex are required to justify the erection of a new genus or genera. Accordingly, this paper retains the use of *Erigeron* for the *Erigeron pappocromus* complex.

KEY TO THE TAXA WITHIN *ERIGERON PAPPOCROMUS* LABILL. COMPLEX

1 Leaves glabrous or if hairy with few marginal setae 2
1: Leaves ± covered with multicellular or sessile glandular hairs, margins ± ciliate with multicellular hairs 5

2 Leaves spathulate 3
2: Leaves elliptic or linear, sessile or petiole gradually expanding into lamina 4

3 Leaves flat or occasionally folded, thin (*herbaceous*), textured; margins crenulate; petiole gradually expanding into lamina (Tas.) ..... **1. *Erigeron pappocromus***
3: Leaves ± concave or folded, thick textured (*corneus* or *crassus*), margins ± entire, petiole distinct to 25 mm long (Alpine Tas. & Baw Baws) .. **6. *Erigeron tasmanicus***

4 Leaves elliptic; rosettes typically forming distinct colonies, only occasionally in alpine cushions; disk florets usually yellow (Alpine Tas.) ..... **7. *Erigeron. stellatus***
4: Leaves linear; rosettes solitary or forming colonies of a few plants in alpine cushions; disk florets usually purple (Alpine Tas.) ..... **8. *Erigeron trigonus***

5 Leaves spathulate, entire, yellowish-green, 5–15 mm long, 2–4 mm wide, petiole gradually expanding into lamina, setose with multicellular hairs 1–2.5 mm long; scape to 2 cm long (Alpine N.S.W.) ..... **9. *Erigeron setosus***
5: Leaves not setose, plants typically larger than above 6

6 Plants with spreading rhizomes in montane and alpine swamps; lower bracts on scape typically similar to leaves, scape slender, involucre narrow to 1.5 cm wide at maturity (Vic., N.S.W.) ..... **2. *Erigeron paludicola***
6: Plants with short rhizomes forming colonies; lower bracts on scape distinct from leaves, scape robust, involucre broad 1.2–2.5 cm wide at maturity 7

7 Leaves more or less cuneiform, with distinct border of multicellular acicular and glandular hairs 0.1–0.3 mm long, apex praemorse or ovate-crenate, expanding into lamina (Tas.) ..... **5. *Erigeron gunnii***
7: Leaves spathulate, lamina hirsute or glutinous, commonly crenate or denticulate towards apex 8

8 Leaves hirsute with multicellular hairs (Tas., Vic., N.S.W.). **4. *Erigeron bellidioides***
8: Leaves glutinous from more or less sessile glandular hairs (Vic., N.S.W.) ..... **3. *Erigeron uitidus***

Species descriptions

1. *Erigeron pappocromus* Labill., *Nov. Holl. Pl.* 2: 47 t.193 (1806) '*pappocroma*'

Pappochroma uniflorum Raf., *Fl. Telluriana* 2: 48 (1837) '*uniflora*' *nom. illeg.*, based on above; *Erigeron phlogotrichus* Spreng., *Syst. Veg.* 3: 520 (1826) *nom. illeg.*; *(H)Aplopappus pappocromus* (Labill.) Hook.f., *Hooker's London J. Bot.* 6: 111 (1847) '*Pappochroma*'; *Erigeron pappocromus* var. *billardierei* Benth., *Fl. Austral.*

3:494(1867) '*Billardieri*' *comb. illeg.* '*pappochroma*'; *Lagenopappus pappocromus* (Labill.) Nesom, *Phytologia* 76: 154 (1994).
TYPE: 'Habitat in capite van-Diemen' (Recherche Bay, Tasmania). LECTOTYPE (**here chosen**): [*J.J.H. de*] *Labillardière*, Nova Hollandia; MEL 594988; ISOLECTOTYPES: Specimen collect. Billardicre. com. Prof. Lehmann; MEL 619735, FI (p.p.); see note below.

Rhizomic herb forming ascending rosettes, typically distant although occasionally condensed. *Rhizomes* spreading widely, yellowish-green to brown, glabrous, 1–1.5 mm diameter. *Leaves* spathulate, entire, margins slightly thickened or revolute, crenulate, flat or partly folded, herbaceous, mid-vein apparent, secondary venation sometimes apparent below, 0.7–2(–4) cm long, 2–7(–11) mm wide, lamina glabrous or with a few marginal cilia, apex obtuse, base attenuate, petiole gradually expanding into lamina. *Inflorescence* a simple capitulum. *Scape* 1.5–15(–23) cm long, 0.5–1 mm diameter, sparsely scabrid towards apex with tubercle–based, acicular hairs to 0.1 mm and glandular hairs; bracts 2–6, distant, linear, 5 mm long towards apex. *Involucre* turbinate 1.1–1.5 cm wide, 0.6–1.0 cm high; bracts 26–32, imbricate, 2–3-seriate, linear, acute, apex ciliate or laciniate, often purplish; margins hyaline; outer bracts sparsely scabrid on basal margins with tubercle–based acicular hairs to 0.2 mm; inner bracts glabrous apart from apical setae. *Ray florets* 34–46, 1–3 seriate; corolla white or purplish with limb 3–4 mm long, 0.5 mm wide; style 3.5 mm long, style-arms: subulate 0.5–1 mm long. *Disc florets* 8–14; corolla narrowly funnelform, 5-lobed, 4.5 mm long; style 3.5 mm long; style-arms narrowly elliptic 1 mm long. *Pappus* capillary, white, 3–5 mm long. *Achenes* 2.5 mm long, flattened, smooth with distinctly thickened marginal ribs. (Fig. 1a)

DISTRIBUTION AND HABITAT
Tasmania; alpine and sub-alpine from 750–1200 m altitude, occasional in herb, grass and sedgelands, heaths, cushion plant communities, sphagnum bogs.

CONSERVATION STATUS
Erigeron pappocromus is restricted in habitat, and although uncommon appears to be adequately reserved.

NOTE ON LECTOTYPE
A photograph of the sheet of type material in Herbarium Webbianum (FI) indicates that this may be a mixed collection including *E. tasmanicus*. The material of Florence is not readily available for examination to resolve the ambiguity apparent from the photograph. Accordingly a lectotype has been selected from two sheets representing part of Labillardière's original collection and held at MEL. The first sheet is from Sonder's Herbarium, and the second sheet appears to be from Steetz's Herbarium. The former includes only fragmentary material, and accordingly the latter is selected as a lectotype. The specimen is in accordance with Labillardière's description.

SELECTED SPECIMENS
TASMANIA: Jubilee Range, alt. 886 m, 13 Jan. 1985, *A. Buchanan 5204* (HO); South West of Barn Bluff, alt. 1020 m, 15 Jan. 1989, *P. Collier 3933* (HO); West alpine Tasmania, 1894, *W.V. Fitzgerald* (MEL); Mt Field National Park, near eucalypt Lodge, alt. 1000 m, 24 Jan. 1983, *S.J. Forbes 1289* (CANB, HO, MEL); Hartz Mountains National Park, flat at head of Arve River on Hartz Road, alt. 800 m, 29 Jan. 1983, *S.J. Forbes 1312 p.p.* (AD, CANB, HO, MEL, NSW); 7 km NE Mt LaPerouse on walking track near campsite at head of tributary Many Falls Creek, alt. 760 m, 31 Jan. 1983, *S.J. Forbes 1348* (CANB, HO, MEL); Mt Wellington, *s.d., Gulliver* (MEL); Mt Wellington, 1 Jan. 1839, *R.C. Gunn 1149* (NSW); Summit of 'Cracrofts' on Middle Mount, between Franklin & Gordon Rivers, Macquarie Harbour, 6 Feb. 1847, *J. Milligan 875* (HO, MEL); Cockle Creek, Recherche Bay, Feb. 1857, *C. Stuart 1857* (MEL); Summit Mt Lepeyrouse, Mar. 1857, *C. Stuart 1855* (MEL).

2. *Erigeron paludicola* S.J.Forbes, *sp. nov.*

Erigeron pappocromus Labill. Form A; M. Gray in A.B. Costin *et al.*, *Kosciusko Alpine Fl.* 364 (1979). *Erigeron* sp. B; M.F. Porteners in G.J. Harden (ed.), *Fl. New South Wales* 3: 177 (1992).

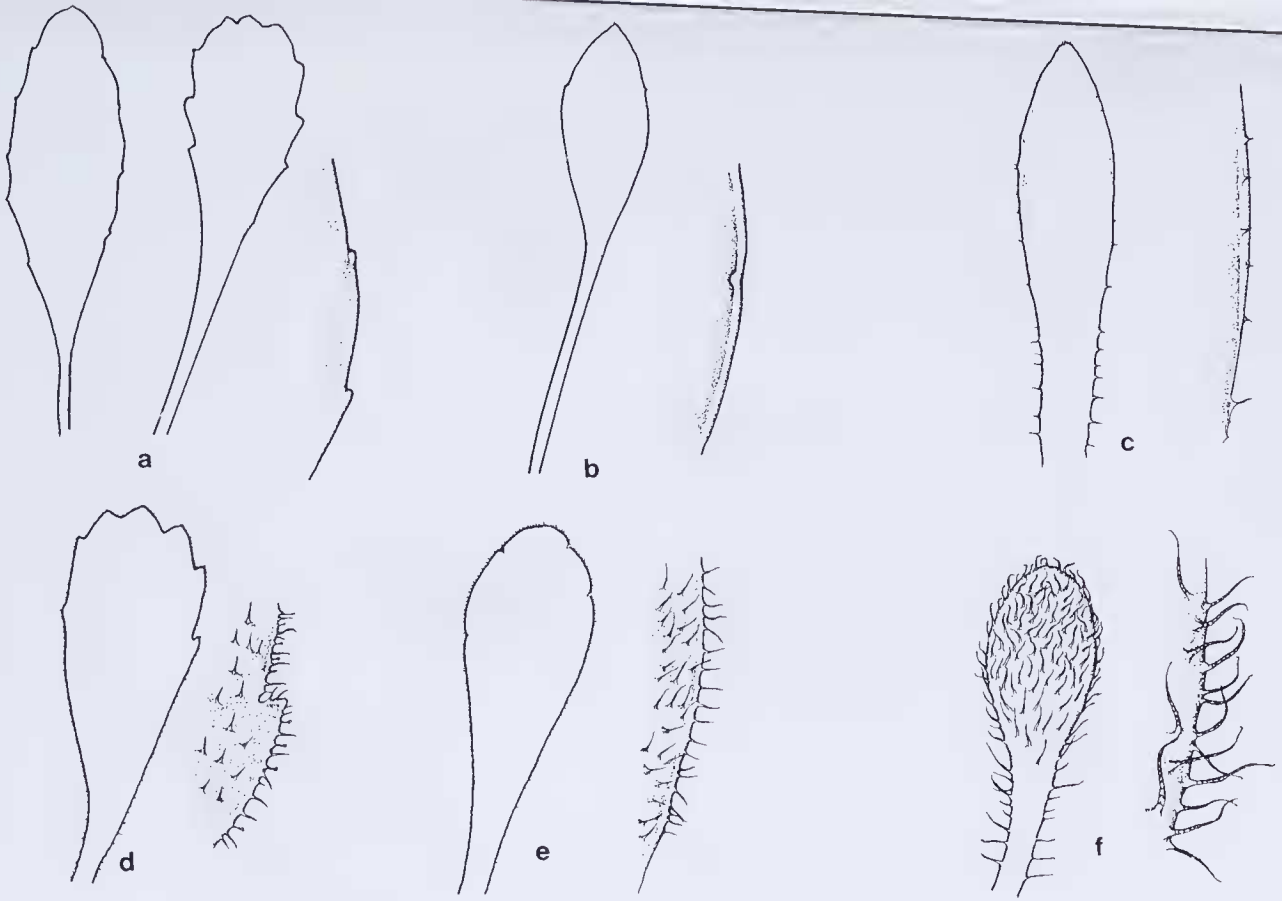

Fig. 1. Leaf shapes and leaf margin details. Top, from left to right: a — *Erigeron pappocromus* x 1.5; b — *E. tasmanicus* x 1.5; c — *E. stellatus* x 4.4); Bottom, from left to right: d. *E. gunnii* x 1.5; e — *E bellidioides* x 1.5; f — *E. setosus* x 3.

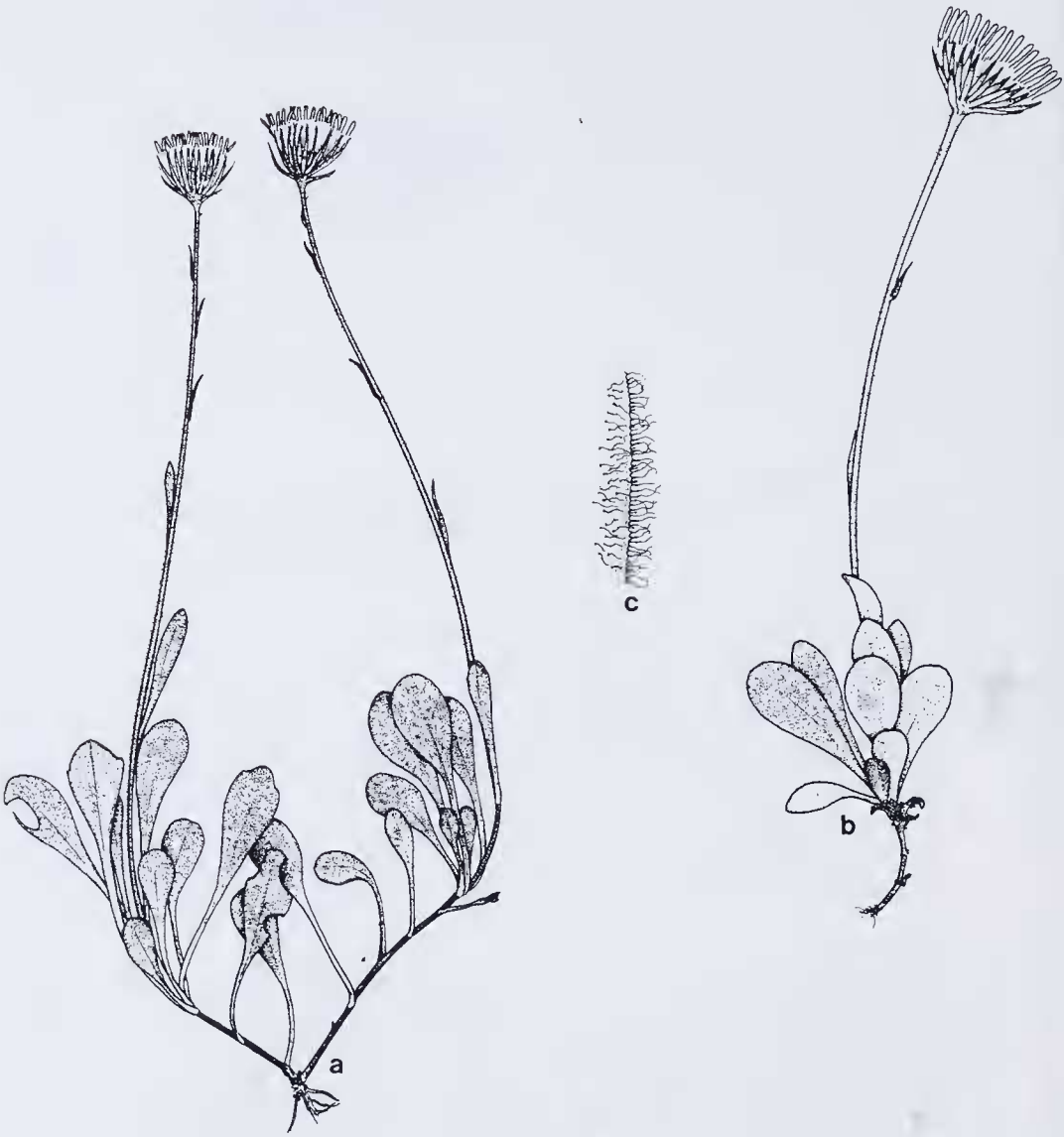

Fig. 2. *Erigeron paludicola* S.J.Forbes. From left to right: a — Whole plant x 0.85; b — Leaf margin detail x 11; c — Whole plant x 1.2.

Erigerontem bellidioidem simulans sed characteribus sequentibus differt. Herba rhizomatosa typice in turbario rosulas debiles ascendentes formans, inflorescentia 5–30 cm altitudine. Folia spathulata integra, flavo-virentia, 2–10 cm longitudine, 4–13 mm latitudine, apice obtuso, base attenuata, petiolo leniter in laminam expansa sparsim setosa pilis multicellularibus 0.2–0.3 mm longitudine et pilis sparsis glanduliferis ad 0.1 mm longitudine. Bracteae 2–4, secus pedunculum distantes, foliis similibus vel basin reductae, linearescentes, versus apicem 5–10 mm longitudine. Involucrum turbinatum 1.0–1.5 cm latitudine, 7–8 mm longitudine.

TYPE: Bogong High Plains, head of Cope Creek, 36°55'15"S, 147°17'00"E, alt. 1700 m, 2 Jan. 1983, *S.J. Forbes 1199*; HOLOTYPE: MEL; ISOTYPE: CANB.

Rhizomic herb forming weak, ascending rosettes. *Rhizomes* spreading widely, yellowish-green to brown, glabrous, 1–1.5 mm diameter. *Leaves* spathulate, entire, yellowish-green, 2–10 cm long, 4–13 mm wide, apex obtuse, base attenuate; petiole gradually expanding into lamina, sparsely setose with multicellular hairs 0.2–0.3 mm long with occasional glandular hairs to 0.1 mm. *Inflorescence* a simple capitulum. *Scape* 5–30 cm long, sparsely setose with multicellular hairs 0.2–0.3 mm long with occasional glandular hairs to 0.1 mm; bracts 2–4, distant along scape, similar to leaves or reduced at base, becoming linear, 5–10 mm long towards apex. *Involucre* turbinate 1.0–1.5 cm wide, 7–8 mm high; bracts 22–28, imbricate, 2-seriate, linear, acute, ciliate; margins hyaline; apices often purplish; outer bracts sparsely setose with multicellular hairs 0.2–0.3 mm long with occasional glandular hairs to 0.1 mm; inner bracts almost glabrous apart from apical cilia. *Ray florets* 22–51, 1–3 seriate; corolla white or purplish with limb 3–4 mm long, 0.5–1 mm wide; style 3.5 mm long; style-arms subulate, 0.4–0.8 mm long. *Disc florets* 6–11, hermaphroditic; corolla narrowly funnelform, 5-lobed, 4 mm long; style 3.5 mm long; style-arms narrowly elliptic 1 mm long. *Pappus* capillary, white, 4 mm long. *Achenes* 3 mm long, flattened, smooth with distinctly thickened marginal ribs. (Fig. 2a-c)

ETYMOLOGY

The specific epithet is derived from Latin and refers to the swampy habitat of the species.

DISTRIBUTION AND HABITAT

New South Wales and Victoria; in alpine and sub-alpine swamps on mainland Australia.

CONSERVATION STATUS

Erigeron paludicola is restricted in habitat, but is widely distributed and adequately reserved.

SELECTED SPECIMENS

NEW SOUTH WALES: Sources of the Hunter River, 1887, *Miss Carter* (MEL).

VICTORIA: Mt Buller, near top of 'Bourke Street', alt. 1650 m, 29 Jan. 1958, *T.B. Muir 354* (MEL); Mt Baw Baw, approx 1.8 km NE of Ski Village along track to Mustering Flat, 19 Feb. 1980, *P.S. Short 1115* (MEL); Mt Buffalo National Park, c. 2 km NE from the Horn, alt. 1480 m, 7 Feb. 1982, *N.G. Walsh 645* (MEL).

3. *Erigeron nitidus* S.J.Forbes, *sp. nov.*

a *Erigeronte bellidioide* circumlitione vernicosa foliorum e glandibus sessilibus exudante, pilis glandulosis et pilis acicularibus plerumque ad nervos pedunculos margines folii restrictis differt.

TYPE: Bogong High Plains, head of Cope Creek, 36°55'30"S, 147°17'00"E, alt. 1700 m, 1 Jan. 1983, *S.J. Forbes 1194*. HOLOTYPE: MEL; ISOTYPES: CANB, HO, NSW.

Fig. 3. *Erigeron nitidus* S.J.Forbes. Whole plant x 1.6.

Erigeron pappocromus Labill. Form B, M. Gray in A.B. Costin *et al.*, *Kosciusko Alpine Fl.* 364 (1979). *Erigeron* sp. A, M.F. Porteners in G.J. Harden (ed.), *Fl. New South Wales* 3: 177 (1992).

Rhizomic herb, often forming colonies comprising rosettes 4–10 cm in diameter. *Rhizomes* not spreading widely, reddish-brown, 2–4 mm in diameter. *Leaves* spathulate, 15–50 mm long, 6–15(–20) mm wide, multicellular glandular and acicular hairs usually restricted to margins and nerves; lamina surface viscid from sessile glands, commonly crenate or denticulate towards apex, base attenuate; petiole gradually expanding into lamina. *Inflorescence* a simple capitulum. *Scape* 2.5–17 cm long, glutinous, sparsely woolly with multicellular hairs; bracts 2–6, distant along scape, becoming linear, 5–10(–20) mm long towards apex of the scape. *Involucre* turbinate, 1.5–2.5 cm wide, 1 cm high.; bracts 25–42, 2–3 seriate, linear, acute, margins hyaline, ciliate towards apex, apices often purplish, viscid with sessile glandular hairs as well as occasional multicellular hairs. *Ray florets* 43–100; corolla white or purplish with limb 4–5 mm long; style 4.5 mm long; style-arms subulate, 1 mm long. *Disc florets* 12–40, hermaphroditic, corolla narrowly funnelform, 5-lobed, 5 mm long; style 3.5 mm long; style-arms narrowly elliptic 1 mm long. *Pappus* capillary, white, 5–6 mm long. *Achenes* 7 mm long, flattened, smooth with distinctly thickened marginal ribs. (Figure 3)

ETYMOLOGY

The specific epithet refers to the shiny, varnished leaf surface characterising this species.

DISTRIBUTION AND HABITAT

New South Wales and Victoria; in alpine grasslands and heathlands of mainland Australia where sympatric with *E. bellidioides*.

CONSERVATION STATUS

Erigeron nitidus is restricted in habitat, but is widely distributed and adequately reserved.

SELECTED SPECIMENS

NEW SOUTH WALES: Munyang Mountains, alt. 4–6,000 ft, Jan. 1855, *F. Mueller* (MEL); Mt Koseiusko, Jan. 1874, *F. Mueller* (MEL).

VICTORIA: Hotham Heights, 27 Mar. 1973, *A.C. Beauglehole 41693* (MEL); Upper Mitta Mitta, *F. Mueller* (MEL); Dargo High Plains, Lankeys Plain, 1 Jan. 1982, *N.G. Walsh* (MEL).

4. *Erigeron bellidioides* (Hook.f.) S.J.Forbes & D.l.Morris, *comb. nov.*
(H)Aplopappus bellidioides Hook.f., *Hooker's London J. Bot.* 6: 112 (1847); *Erigeron gunnii* var. *bellidioides* (Hook.f.) Hook.f., *Flora Tasman.* 1: 183, t.46B (1856).

Erigeron pappocromus var. *gunnii* auct. non (Hook.f.) Benth.: M.F. Porteners in G.J. Harden (ed.), *Fl. New South Wales* 3: 176 (1992). *Erigeron pappocromus* Labill. Form C, M. Gray in A.B. Costin *et al.*, *Kosciusko Alpine Fl.* 364 (1979).

TYPE: Middlesex Plains, Tas., *Gunn 692*; HOLOTYPE: K photograph seen, see note.

Rhizomic herb, often forming spreading colonies of rosettes 4–10 cm in diameter. *Rhizomes* not spreading widely, reddish-brown, 2–4 mm in diameter, clothed in scale-like deltoid bracts 1–2 mm long, narrowly triangular, 6–10 mm at base of rosette. *Leaves* spathulate, 15–80 mm long, 5–15(–20) mm wide; lamina hirsute with multicellular hairs 0.1–1 mm long with a few sessile glands, commonly crenate or denticulate towards apex, base attenuate, margins ciliate, petiole gradually expanding into lamina. *Inflorescence* a simple capitulum. *Scape* 1.5–30 cm long, at first woolly with multicellular hairs to 0.5 mm. *Bracts* 2–6, distant along scape, becoming linear, 5–10(–20) mm long towards apex of scape. *Involucre* turbinate, 1.5–2.5 cm wide, 1 cm high; bracts 25–45, 2–3 seriate, linear, acute, margins hyaline, ciliate towards apex, apices often

purplish, viscid with sessile glandular hairs as well as occasional multicellular hairs. *Ray florets* 33–100; corolla white or purplish with limb 4–5 mm long; style 4.5 mm long, style-arms subulate, 1 mm long. *Disc florets* 8–40, hermaphroditic; corolla narrowly funnelform, 5-lobed, 5 mm long; style 3.5 mm long; style-arms narrowly elliptic 1 mm long. *Pappus* capillary, white, 5–6 mm long. *Achenes* 5.5–7 mm long, flattened, smooth with distinctly thickened marginal ribs. (Fig. 1e)

DISTRIBUTION AND HABITAT

New South Wales, Victoria, Tasmania; in alpine and sub-alpine grasslands and heathlands of mainland Australia where sympatric with *Erigeron nitidus*, and extending from alpine to montane grasslands and heathlands in Tasmania.

CONSERVATION STATUS

Erigeron bellidioides is restricted in habitat, but is widely distributed and adequately reserved.

NOTES

The two large specimens on the left of the holotype sheet are apparently from Middlesex Plains – the remainder of the material on the sheet is from St Patricks River. The holotype may include specimens illustrated by Fitch in Flora Tasmaniae t.46 B as *E. gunnii*, although the details are apparently of the holotype of *E. gunnii*.

SELECTED SPECIMENS

NEW SOUTH WALES: Barrington Tops National Park, Polblue Swamp, 12 Dec. 1989, *A. Anderberg & A-L. Anderberg 7189* (MEL, S); Mt Kosciusko, Jan. 1874, *F. Mueller* (MEL).

VICTORIA: Bogong High Plains, Cope Creek, alt. 1700 m, *S.J. Forbes 1192* (CANB, HO, MEL, NSW); Moroka Valley, Mar. 1861, *F. Mueller* (MEL); Bogong High Plains, headwaters of Cope Creek, 1.75 km NE Mt Cope, alt. 1690 m, 11 Dec. 1980, *H. van Rees 222* (MEL); Mt Baw Baw, 1.8 km NE of Ski Village along track to Mustering Flat, 19 Feb. 1980, *P.S. Short 1118* (MEL); Mt Buffalo National Park, snow plain at base of Mt McLeod, alt. 1400 m, 27 Jan. 1982, *P.S. Short 1390* (MEL); 'Diggers Holes', Nunniong Plateau., alt. 4,500 ft, 5 Jan. 1949, *N.A. Wakefield 2635* (MEL).

TASMANIA: Iris River-Cradle Valley Road crossing, 10.5 km by road N Waldheim, 20 Jan. 1983, *S.J. Forbes 1240* (CANB, HO, MEL); Ben Lomond National Park, ski-slopes near summit Legges Tor, alt. 1550 m, 4 Feb. 1983, *S.J. Forbes 1395* (CANB, HO, MEL, NSW); Diddleum Plains, St Patricks, 16 Nov. 1844, *R.C. Gunn 692* (NSW);

5. *Erigeron gunnii* (Hook.f.) F. Muell. ex Hook.f. *Flora Tasman.* 1: 183 (1856).

(H)Aplopappus gunnii Hook.f., *Hooker's. London J. Bot.* 6: 111 (1847); *Erigeron pappocronus* Labill. var. *gunnii* (Hook.f.) Benth., *Fl. Austral.* 3: 494 (1867); *Lagenopappus gunnii* (Hook.f.) Nesom, *Phytologia* 76: 154 (1994); *Pappochroma gunnii* (Hook.f.) Nesom, *Phytologia* 76:426 (1994).

TYPE: Mount Wellington, Tasmania; 31 Jan. 1840, *R. Gunn 1151*; HOLOTYPE: K photograph seen; ISOTYPE: NSW 275467; POSSIBLE ISOTYPE: MEL.

Rhizomic herb, often forming colonies, in rosettes 2–10 cm in diameter. *Rhizomes* not spreading widely, reddish-brown, 2–4 mm in diameter clothed in scale-like triangular or broad triangular bracts, c. 2.5 mm long, triangular to narrow-triangular c. 3 mm long at base of rosette. *Leaves* cuneiform, 10–50 mm long, 5–15 mm wide, lamina glabrous to sparsely scaberulous from tubercle-based deciduous hairs, margins with distinct border of multicellular acicular and glandular hairs 0.1–0.3 mm long, or occasionally with acicular hairs only, apex praemorse or ovate-crenate, commonly, base attenuate, petiole usually distinct and gradually expanding into lamina. *Inflorescence* a simple capitulum. *Scape* 3–15(–25) cm long, at first woolly with multicellular acicular and glandular hairs to 0.3 mm. *Bracts* 2–6(–7), distant along scape, becoming linear, 5–10 mm long towards apex. *Involucre* turbinate, 1.2–2.0 cm wide, 0.8–1.0 cm high. *Bracts* 25–30, 2–3 seriate, linear, acute, margins ciliate towards apex, margins hyaline, apices often purplish, sparsely setose with multicillular glandular hairs 0.2–0.3 mm long, inner bracts almost

glabrous apart from apical setae. *Ray florets* 35–95; corolla white or purplish with limb 4 mm long. *Style* 4.5 mm long, style-arms subulate, 1 mm long. *Disc florets* 12–29, hermaphroditic, corolla narrowly funnelform, 5–lobed, 3.5 mm long. *Style* 3.5 mm long; style-arms narrowly elliptic 1 mm long. *Pappus* capillary, white 5 mm long. *Achenes c.* 3.5 mm long, flattened, smooth with distinctly thickened marginal ribs. (Fig. 1d)

SELECTED SPECIMENS

TASMANIA: 1 km ENE of Nevada Peak, alt. 1190 m, 25 Feb. 1990, *P. Collier 4551* (HO); Mt. Wellington near pinnacle, 28 Jan. 1983, *S.J. Forbes 1308* (MEL); Hartz Mountains National Park, near summit Hartz Peak, alt. 1230 m, 1 Feb. 1983, *S.J. Forbes 1354* (CANB, HO, MEL, NSW); Ben Lomond National Park, Ski Village, alt. 1480 m, 3 Feb. 1983, *S.J. Forbes 1387* (HO, MEL); Mt Wellington, Diamond Springs above Ploughed Field, 27 Mar. 1878, *J. Milligan 1132* (MEL); Snowdrift Tarn, Snowy Range, 22 Mar. 1983, *A. Moscal* 2181 (HO).

DISTRIBUTION AND HABITAT

Alpine and sub-alpine grasslands and heathlands of Tasmania.

CONSERVATION STATUS

Erigeron gunnii is restricted in habitat, but is widely distributed and adequately reserved.

NOTE

The holotype includes preliminary drawings for the details illustrated by Fitch in *Flora Tasmaniae* t. 46B as *E. gunnii*. The mature plants illustrated are probably referable to *E. bellidioides*.

6. *Erigeron tasmanicus* (Hook.f.) Hook.f., *Fl. Tasman.* 1: 183, t.46A (the right-hand figure) (1856).

(H)Aplopappus tasmanicus Hook.f., *Hooker's. London J. Bot.* 6: 110 (1847); *Erigeron pappocromus* Labill. var. *oblongatus* Benth., *Fl. Austral.* 3: 494 (1867); *Lagenopappus tasmanicum* (Hook.f.) Nesom, *Phytologia* 76: 154 (1994); *Pappochroma tasmanica* (Hook.f.) Nesom, *Phytologia* 76: 426 (1994).

TYPE: Mount Wellington, Tasmania, *Gunn 1150*; HOLOTYPE: K, photograph seen; POSSIBLE ISOTYPE: NSW 51741.

Rhizomic herb forming ascending rosettes, typically distant although occasionally condensed. *Rhizomes* spreading widely, yellowish-green to brown, glabrous, 1–3 mm diameter. *Leaves* spathulate, entire, margins thickened, sometimes distantly and minutely serrulate, often more or less concave or folded, bright-green, with only mid–vein apparent, (0.7–)1–5(–7) cm long, 3–9 mm wide, lamina at first sparsely and minutely scabrid with tubercle based multicellular hairs to 0.1 mm long and occasional sessile glands, apex acute or occasionally emarginate, base attenuate; petiole gradually expanding into lamina, occasionally with a few distant marginal cilia at the base. *Inflorescence* a simple capitulum. *Scapes* 1.5–15 cm long, sparsely scabrid with tubercle-based acicular hairs to 0.1 mm. *Bracts* 2–6, distant along scape, similar to leaves at base, becoming linear, 5 mm long towards apex. *Involucre* turbinate 1.1–1.5 cm wide, 0.6 cm high; bracts 24–40, imbricate, 2–3-seriate, linear acute, apex minutely ciliate; margins hyaline, apices often purplish, outer bracts sparsely scabrid with tubercle-based, acicular hairs to 0.2 mm, inner bracts glabrous apart from apical cilia. *Ray florets* 23–55, 1–3 seriate; corolla white or purplish with limb 3 mm long, 0.5–0.6 mm wide; style 3.5 mm long; style-arms subulate 0.5–1 mm long. *Disc florets* 4–14, hermaphroditic; corolla narrowly funnelform, 5-lobed, 3.5 mm long; style 3.5 mm long; style-arms narrowly elliptic, 1 mm long. *Pappus* capillary, white, 3 mm long. *Achenes* 2.5–3 mm long, flattened, smooth with distinctly thickened marginal ribs. (Fig. 1b)

SELECTED SPECIMENS

VICTORIA: Baw Baw National Park, Currawong Flat, alt. 1465 m, 5 Dec. 1981, *N.G. Walsh 682* (MEL); Baw Baw Plateau, Currawong Flat, alt. 1470 m, 26 Feb. 1991, *N.G. Walsh 3052* (MEL); Baw Baw Plateau, Pauciflora Flat, alt. 1450 m, 26 Feb. 1991, *N.G. Walsh 3056* (MEL).

TASMANIA: 1 km N of Resevoir Lake, alt. 750 m, *D.G. Adams 30* (HO); West alpine Tasmania, 1894, *W.V. Fitzgerald* (MEL); Cradle Mountain National Park, Crater Peak lookout-Horse Trail intersection, 3 km NNW summit Cradle Mountain, alt. 1240 m, 19 Jan. 1983, *S.J. Forbes 1219* (CANB, HO, MEL); Hartz Mountains National Park, flat at head of Arve River on Hartz Road, alt. 800 m, 29 Jan. 1983, *S.J. Forbes 1312 p.p.* (AD, CANB, HO, MEL, NSW); Mt Wellington near pinnacle, 28 Jan. 1983, *S.J. Forbes 1307* (CANB, HO, MEL); Hill One, 5 km NNE Mt La Perouse on walking track, alt. 980 m, 31 Jan. 1983, *S.J. Forbes 1337* (MEL); Ben Lomond National Park, ski village, alt. 1480 m, 3 Feb. 1983, *S.J. Forbes 1386* (CANB, HO, MEL).

DISTRIBUTION AND HABITAT

Tasmania and Victoria, on the Baw Baw Plateau; in alpine and sub-alpine grassland, herbfield and heathland.

CONSERVATION STATUS

Erigeron tasmanicus is restricted in habitat, but is widely distributed and adequately reserved in Tasmania. The species is rare in Victoria, and although adequately reserved, appears vulnerable due to rarity

7. *Erigeron stellatus* (Hook.f.) W.M. Curtis, *Students Fl. Tas.* Pt.2: 463 (1963).

(H)Aplopappus stellatus Hook.f., *Hooker's. London J. Bot.* 6: 112 (1847); *Erigeron tasmanicus* var. *stellatus* (Hook.f.) Hook.f., *Flora Tasman.* 1: 183, t.46A (the left–hand figure)(1856); *Erigeron pappocronus* var. *stellatus* Benth., *Fl. Austral.* 3: 494 (1867); *Lagenitlrix stellata* (Hook.f.) Nesom, *Phytologia* 76: 151 (1994).

TYPE: Mountains (? Hampshire Hills), Tas., *Gunn 279*; HOLOTYPE: K, photograph seen, the top three specimens on the sheet are referable to this collection; POSSIBLE ISOTYPE: NSW 275470

Rhizomic herb forming stiff rosettes. *Rhizomes* spreading, yellowish-green to brown, glabrous, scales triangular 2–3 mm long, 1–2.5 mm diameter. *Leaves* narrowly elliptic, occasionally broadest above the middle or spathulate, entire, yellowish-green, 1–3 cm long, 1.5–3.5 mm wide, apex obtuse with a few apical setae 0.3–0.8 mm long, base attenuate, sessile or petiole gradually expanding into lamina, lower margin with a few tubercle-based multicellular setae 0.3–0.8 mm long, and occasional multicellular glandular hairs to 0.1 mm, otherwise glabrous. *Inflorescence* a simple capitulum. *Scapes* 5–6.5 cm long, sparsely setose with multicellular hairs 0.2–0.3 mm long with occasional glandular hairs to 0.1 mm. *Bracts* 2–4, distant along scape, similar to leaves at base, becoming linear, 5–10 mm long towards apex. *Involucre* turbinate 0.6–0.8(–1.5) cm wide, 1.0–1.6 cm high; bracts 22–28, imbricate, 2-seriate, linear, acute, apex ciliate often purplish; margins hyaline; outer bracts sparsely setose with multicellular hairs 0.2–0.3 mm long with occasional glandular hairs to 0.1 mm; inner bracts almost glabrous apart from apical cilia. *Ray florets* 22–51, 1–3 seriate; corolla white or purplish with limb 3–4(–5) mm long, 0.5–1.5 mm wide; style 3.5 mm long; style-arms subulate, 0.4–0.8 mm long. *Disc florets* 6–11(–28) hermaphroditic, corolla narrowly funnelform, 5–lobed, 4 mm long; style 3.5 mm long; style-arms narrowly elliptic 1 mm long. *Pappus* capillary, white, 3–4 mm long. *Achenes* 2.5–3 mm long, flattened, sparsely setose with occasional sessile glandular hairs, and with distinctly thickened marginal ribs. (Figs 1c & 4e)

SELECTED SPECIMENS

TASMANIA: Mt Counsel, western slopes, highest point, north, in view from Melaleuca Settlement, alt. 2,400 ft, 19 Mar. 1954, *M. Davis 1465* (MEL); Cradle Mountain National Park, summit Cradle Mountain, alt. 1540 m, 19 Jan. 1983, *S.J. Forbes 1220* (CANB, HO, MEL); SE slope of Great Dome, alt. 1200 m, 22 Jan. 1983, *S.J. Forbes 1266* (MEL); Mt Sorell, Macquarie Harbour, alt. 3000 ft, 25 Jun. 1847, *J. Milligan 874* (MEL); Mt Gaffney, alt. 480 m, 14 Jan. 1986, *A. Moscal 11678* (HO); Mt Field National Park, low saddle between top of ski tow and Mt Mawson, alt. 1280 m, 14 Feb. 1989, *N.G. Walsh 220* (MEL).

DISTRIBUTION AND HABITAT
Tasmania; on exposed alpine areas of Tasmania although absent from Ben Lomond and Mt Wellington, and occuring as low as 480 m in the south west.

CONSERVATION STATUS
Erigeron stellatus is restricted in habitat, but appears adequately reserved.

8. *Erigeron trigonus* S.J.Forbes & D.I.Morris, *sp. nov.*

a *Erigeronte stellato* foliis 5–14 mm longitudine, linearibus, ± trigonis, apiculatis, marginibus non nisi prope basin pectinato–ciliatis et flosculis disci proprie atropurpeis differt.

TYPE: Hamilton Crags, Ben Lomond, Tas., 41°43'S, 147°41'E, 1460 m, 5 Jan. 1992, *A. Moscal 22287*; HOLOTYPE: HO; ISOTYPE: MEL, NSW.

Rhizomic herb forming distant rosettes. *Leaves* 5–14 mm long, glabrous, coriaceous, shining, linear, trigonous to almost terete, becoming channelled on drying, flattened below; margins of the flattened part pectinate-ciliate, the cilia septate; apex purple, narrowing ± abruptly to a stout colourless apiculum up to 0.5 mm long, this eroding with age. *Inflorescence* a simple capitulum. *Scape* 2.3–5 cm high, purple, glabrous or with scattered glandular or eglandular septate hairs or a combination of both. *Bracts* 1–3(–7) linear, 2–4 mm long. *Involucre* turbinate, *c.* 10 mm wide; bracts 25–35, 2–3 seriate, 3–5.5 mm long, purple, margins glabrous or minutely ciliate. *Ray florets* 20–30; corolla white or tipped purple or pink, limb *c.* 4.5 mm long, tube with a few weak hairs at throat; style *c.* 2 mm long; style-arms 1 mm long. *Disc florets* 5–12, purple, corolla, narrow-funnelform, 5-lobed, 5 mm long, with a few weak hairs at the midpoint. *Pappus* capillary, white, 3.5–4 mm long. *Achenes* 2–2.5 mm long, flattened, sparsely hairy with a denser tuft of hairs at the base. *Mature achenes* not seen. (Fig. 4a-d)

ETYMOLOGY
The specific epithet refers to the characteristically three-sided leaves of *Erigeron trigonus*.

DISTRIBUTION AND HABITAT
Tasmania; in alpine heath and feldmark, often amongst cushion plants.

CONSERVATION STATUS
Erigeron trigonus is restricted in habitat and rare. Although adequately reserved the species appears vulnerable due to rarity.

SELECTED SPECIMENS
TASMANIA: Newdegate Slopes, 4 May 1930, *H.F. Comber* 2635 (HO); Eliza Plateau, 22 Jan. 1983, 1200 m, *S.J. Forbes 1263* (MEL); Eliza Plateau, 22 Jan. 1983, 1200 m, *S.J. Forbes 1264* (MEL); Mt Field National Park, low saddle between top of ski tow and Mt Mawson, alt. 1280 m, 14 Jan. 1989, *N.G. Walsh 2281* (MEL).

9. *Erigeron setosus* (Benth.) M. Gray, *Contr. Herb. Aust.* 6: 1 (1974).

Erigeron pappocromus var. *setosus* Benth., *Fl. Austral.* 3: 494 (1867); *Lagenithrix setosa* (Benth.) Nesom, *Phytologia* 76: 150 (1994).

TYPE: 'In vertice montis Kosciusko, locis glareosis, 6000–6500 ft radius albus vel rubellus, 1 Jan. 1855, F. Mueller. Munyang Mountains, Victoria, *F. Mueller* 6000–6500 ft'. LECTOTYPE (*fide* M. Gray, 1974): MEL 1012236.

Rhizomic herb producing crowded rosettes. *Rhizomes* spreading, yellowish-green to brown, glabrous, scales triangular, 2–3 mm long, 1–2.5 mm diameter. *Leaves* spathulate,

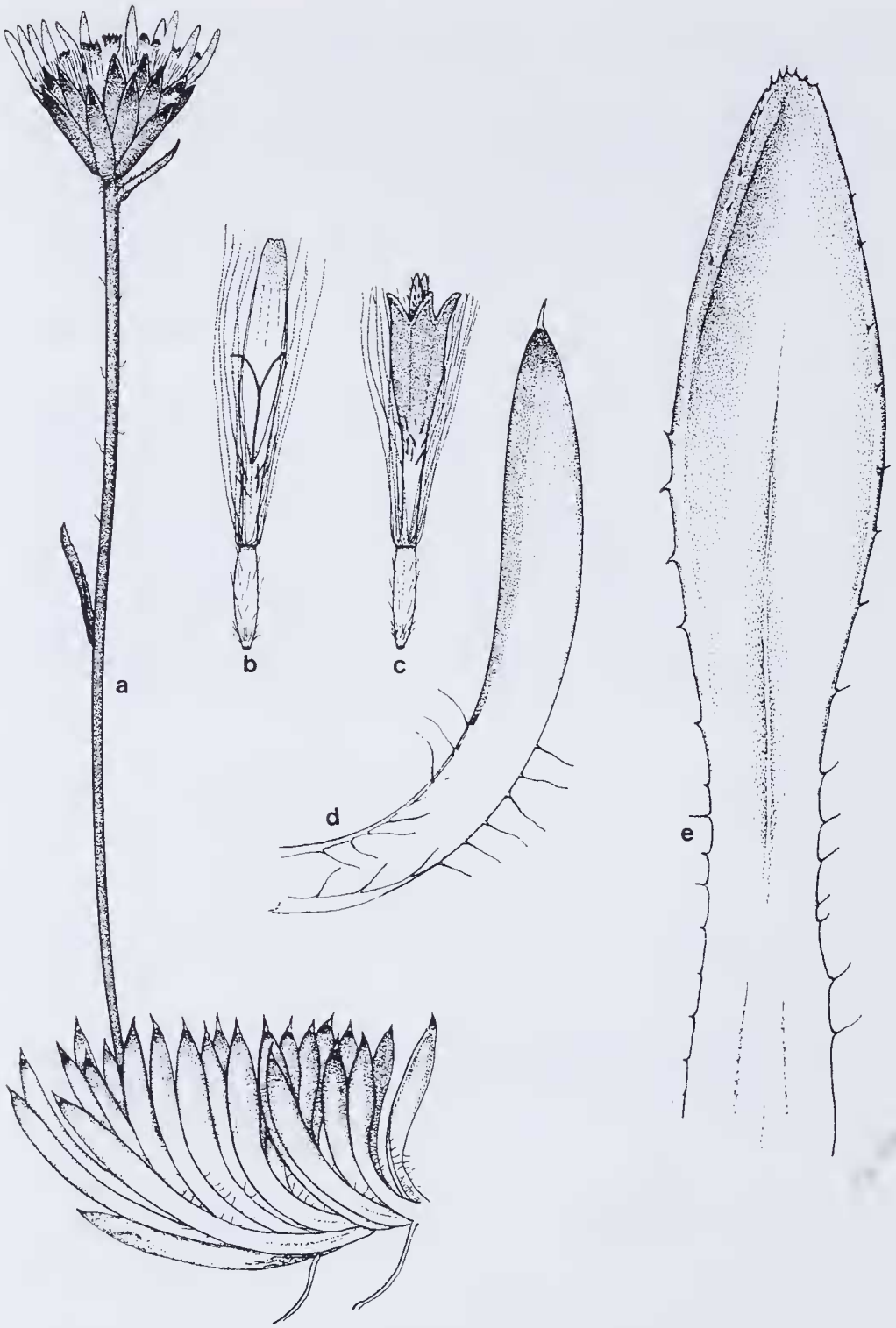

Fig. 4. *Erigeron trigonus* S.J.Forbes & D.I.Morris. From left to right: a — Whole plant x 3; b — Ray floret x 7.5; c — Disc floret x 7.5; d — Leaf x 7.5; e — *E. stellatus* leaf x 7.5.

entire, yellowish-green, 5–15 mm long, 2–4 mm wide, apex obtuse, base attenuate, petiole gradually expanding into lamina, setose with multicellular hairs 1–2.5 mm long. *Inflorescence* a simple capitulum. *Scapes* to 2 cm long, sparsely setose with multicellular hairs 1–2.5 mm long with occasional glandular hairs to 0.1 mm. *Bracts* linear. *Involucre* turbinate 0.6–0.8 cm wide, 1.0–1.6 cm high; bracts 19–32, imbricate, 2-seriate, linear, acute, apex ciliate, often purplish; margins hyaline; outer bracts sparsely setose with multicellular hairs 0.2–0.3 mm long with occasional glandular hairs to 0.1 mm; inner bracts almost glabrous apart from apical setae. *Ray florets* 32–38, 1–3 seriate; corolla white or purplish with limb 2.5–3 mm long, 0.5 mm wide; style 3 mm long; style-arms subulate 0.4–1 mm long. *Disc florets* 6–9, hermaphroditic; corolla narrowly funnelform, 5-lobed, 3 mm long; style 3.5 mm long; style-arms narrowly elliptic 1 mm long. *Pappus* capillary, white, 4 mm long. *Achenes* 3 mm long, flattened, smooth or sparsely glandular, with distinctly thickened marginal ribs. (Figure 1 f)

DISTRIBUTION AND HABITAT

Kosciusko Plateau, New South Wales; in alpine herbfields.

CONSERVATION STATUS

Erigeron setosus is restricted in habitat, but appears adequately reserved.

SELECTED SPECIMENS

NEW SOUTH WALES: 1 km ENE Rams Head, W of Mt Kosciusko foot track from summit of Thredbo Village main chairlift, alt. 2100 m, 12 Feb. 1985, *S.J. Forbes 2816* (MEL); Etheridge Range, 1 km SSW of Seamans Hut, alt. 2012 m, 17 Jan. 1972, *J. Thompson 1344* (MEL, NSW); Hedley Tarn below Blue Lake, Kosciusko Plateau, 5 Feb. 1946, *J.H. Willis* (MEL).

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